## What is claimed is:

[Claim 1] 1. A filter for a drill string, comprising:

a perforated receptacle having an open end and a perforated end;

a flange adjacent the open end comprising first and second mounting surfaces; and

a transmission element disposed in each of the first and second mounting surfaces,

wherein the respective transmission elements are in electrical communication with each other and with a transmission network integrated into the drill string.

[Claim 2] 2. The filter of claim 1 wherein each mounting surface comprises a groove which houses the transmission element.

[Claim 3] 3. The filter of claim 2 wherein at least on of the mounting surfaces comprise a passageway intersecting the groove and in fluid communication with the open end of the filter.

[Claim 4] 4. The filter of claim 2 wherein at least one of the grooves comprise a biasing element adapted to bias the transmission element towards an adjacent transmission element.

[Claim 5] 5. The filter of claim 1 wherein the transmission elements are selected from the group consisting of inductive couplers, direct electrical contacts, and optical couplers.

[Claim 6] 6. The filter of claim 1 wherein the transmission elements are connected by a third conductor forming a LC circuit.

[Claim 7] 7. The filter of claim 6 wherein a capacitor modifies electrical characteristics of the LC circuit.

[Claim 8] 8. The filter of claim 1 wherein the perforated receptacle is corrosion-resistant.

[Claim 9] 9. The filter of claim 1 wherein the filter further comprises electronic an component.

[Claim 10] 10. The filter of claim 9 wherein the electronic component is selected from the group consisting of a sensor, a router, a power source, a clock source, a repeater, an electronic processor, an integrated circuit, a network node, and an amplifier.

[Claim 11] 11. The filter of claim 1 wherein the filter further comprises a mandrel mounted coaxially within a central bore of the drill pipe and adapted for removing the filter.

[Claim 12] 12. A filter for a drill string, comprising:

a perforated, corrosive resistant receptacle having an open end and a perforated end;

first and second mounting surfaces adjacent the open end; and

a transmission element disposed within a groove in each of the first and second mounting surfaces,

wherein the respective transmission elements are in communication with each other via an electrical conductor forming an LC circuit and with a transmission network integrated into the drill string.

[Claim 13] 13. The filter of claim 12 wherein the mounting surfaces comprise a passageway intersecting the groove and in fluid communication with the open end of the filter.

[Claim 14] 14. The filter of claim 12 wherein the groove comprises a biasing element adapted to bias the transmission elements towards adjacent transmission elements.

[Claim 15] 15. The filter of claim 12 wherein the transmission elements are selected from the group consisting of inductive couplers, direct electrical contacts, and optical couplers.

[Claim 16] 16. The filter of claim 12 wherein a capacitor modifies electrical characteristics of the conductor.

[Claim 17] 17. The filter of claim 12 wherein the filter further comprises an electronic component.

[Claim 18] 18. The filter of claim 17 wherein the electronic circuitry is selected from the group consisting of a sensor, a router, a power source, a clock source, a repeater, an electronic processor, an integrated circuit, a network node, and an amplifier.

[Claim 19] 19. The filter of claim 12 wherein the filter further comprises a mandrel mounted coaxially within a central bore of the drill pipe and adapted for removing the filter.